

NATURAL RESOURCES CONSERVATION SERVICE

VIRGINIA CONSERVATION PRACTICE STANDARD

ANIMAL MORTALITY FACILITY

(No.)

Code 316

DEFINITION

An on-farm facility for the treatment or disposal of livestock and poultry carcasses.

PURPOSE

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Decrease non-point source pollution of surface and groundwater resources.
- Reduce the impact of odors that result from improperly handled animal mortality.
- Decrease the likelihood of the spread of disease or other pathogens that result from the interaction of animal mortality and predators.
- Provide contingencies for normal and catastrophic mortality events.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where animal carcass treatment or disposal must be considered as a component of a waste management system for livestock or poultry operations. It applies where on-farm carcass treatment and disposal is permitted by Federal, state, and local laws, rules, and regulations. This practice includes disposal of both normal and catastrophic animal mortality; however, it does not apply to catastrophic mortality resulting from disease.

CRITERIA

GENERAL CRITERIA APPLICABLE TO ALL PURPOSES

The facility shall be designed to handle normal mortality and/or catastrophic mortality.

The planning and design of animal mortality facilities or processes must conform to all Federal, state, and local laws, rules, and regulations. This includes provisions for locating, closing and/or removing the facility, where required.

All structural components integral to animal mortality management shall meet the structural loads and design criteria as described in the Virginia Conservation Practice Standard *Waste Storage Facility (Code 313)*, unless otherwise designated.

Location

A location shall be chosen that will minimize the impact of the facility on odor and other air quality issues affecting neighboring residences and minimize the impact of the facility on surface and groundwater resources. Where practical, the facility shall be down-gradient from a spring or well.

The location selected must meet the minimum separation distances described in Table 1 of the Virginia Conservation Practice Standard *Waste Storage Facility (Code 313)*. It is recommended that a mortality disposal facility

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

should be a minimum of 900 feet (270m) from a neighboring residence. A greater separation distance of 200 feet from private wells is recommended for animal mortality composters.

The animal mortality facility should be located outside of the floodplain; however, if site restrictions require location within a floodplain, it shall be protected from inundation or damage from a minimum of a 100-year event.

The location of the animal mortality facility shall be consistent with the overall site plan for the livestock or poultry operation.

Surface runoff shall be directed away from the facility.

Seepage Control

Where seepage from mortality facilities will create a potential water quality problem, use Appendix 10D of the AWMFH, for liner design criteria.

Soils and Foundations

Avoid sandy or gravelly soils and shallow soils over fractured or cavernous rock. Seek soils of slow to moderate permeability, where possible.

Design Bottom Elevation

The design bottom elevation of the mortality facility shall be no lower than 2 feet (0.6m) above the seasonal high water table.

CRITERIA APPLICABLE TO NORMAL MORTALITY

The facility shall be located as close to the source of the mortality as practical, considering bio-security issues and the need to keep the facility out of sight of the general public.

Composters

Design of facilities for composting animal mortality shall conform to Virginia Conservation Practice Standard *Composting Facility (Code 317)*. Animal

mortality composters shall be installed on concrete floors. Procedures for sizing and operating composters for normal mortality are given in Engineering Technical Note 5, *Management of Animal Mortality Composters*, Engineering Technical Note #6, *Composting Swine Mortality*, and Engineering Technical Note #7, *Composting Poultry Mortality – Bin Sizing Worksheet*.

Mortality shall be composted daily. Dead animals or poultry shall be covered completely immediately after placement in the composter to avoid odor, vector, and scavenger problems.

Freezers

Freezers may be used to temporarily store the normal farm mortality prior to transport to a rendering facility or incinerator. Carcasses to be composted should not be frozen.

Freezer units shall be of the chest type with a construction compatible with the mechanism to be used to empty the freezer. Provisions for protecting the freezer unit from precipitation and direct sun shall be provided, where appropriate.

The freezer unit design and construction, power source, and unit installation shall be in accordance with manufacturer's recommendations. Freezers shall be constructed of durable material with a life expectancy compatible with other aspects of the waste management system. The freezer container shall be leak-proof to minimize odor and leachate pollution.

Freezer units shall be placed on a pad of suitable strength to withstand loads imposed by vehicular traffic consistent with equipment used to load and remove the box or tray.

Temperature

The freezers shall be self-contained units designed to freeze animal carcasses before decomposition occurs. Temperature of the carcasses shall be maintained between 22° and 26°F.

Capacity

Freezer units shall be sized to accommodate the normal maximum volume of mortality to be expected in the interval between emptying. Volume calculations shall include the expected mortality rate of the animal, the period of time between emptying where mortality is given on a per day basis, the average weight of the animal between emptying, and a conversion factor for weight to volume. Capacity calculations shall be supported by a written removal schedule supplied by an approved vendor.

Power Source

An alternative source of power, where available, shall be used to maintain the integrity of the freezing process during power outages. Where an alternative power source will not be available, the operation and maintenance plan shall contain contingencies for disposal of the animal mortality.

Incinerators

Incinerators shall be dual burning Type 4 (human and animal remains) approved for use within the state. A permit from the Virginia Department of Environmental Quality is required.

Capacity

Minimum incinerator capacity shall be based on the average daily weight of animal mortality and the length of time the incinerator will be operated each day.

Location

The incinerator shall be located a minimum of 20 feet from any structure. The incinerator shall be placed on a concrete pad with the fuel source as distant as practical. If the incinerator is covered with a roof, there shall be at least six inches between the incinerator chimney and any combustible roof parts.

CRITERIA APPLICABLE TO CATASTROPHIC MORTALITY

Processes addressed by this standard shall be limited to burial and composting. Catastrophic mortality shall be collected as soon as practical and moved away from the production facility.

Location

The facility shall be located as far away from neighboring dwellings and the poultry or livestock operation as site conditions permit, and in accordance with local laws, regulations, and permits. Locate on sites with restricted percolation and a minimum of two feet between the bottom of the facility and the seasonal high water table unless special design features are incorporated that address seepage rates and non-encroachment of contaminants into the water table. Use the AWMFH, Appendix 10D, for selection of sites where seepage will be restricted with normal construction techniques.

Composting

Catastrophic mortality composting shall be in windrows as described in the National Engineering Handbook, Part 637, Chapter 2 – Composting (NEH 637.0210 and NEH 637.0211). A variance from the State Veterinarian is required.

The windrows shall be protected from precipitation as necessary, or provisions made for collecting contaminated runoff. Static piles or windrows covered with sawdust, finished compost, or other benign material will not need to be covered.

The windrows shall also be protected from predators by the use of fencing.

Burial Pit

Burial of catastrophic mortality is subject to state and local regulations and may not be allowed in some jurisdictions. If it is permitted, catastrophic mortality resulting from natural conditions such as temperature extremes shall be buried on-site or as otherwise directed by

state and local regulatory agencies. Burial of catastrophic mortality shall be timed to minimize the effects of mortality expansion during early stages of the decay process. Where possible and permitted by state law and local regulations, mortality shall remain uncovered or lightly covered until bloating has occurred, or methods employed to reduce or eliminate bloating. Topsoil shall be retained to re-grade the disposal site after the ground has settled as the decay process is completed. Stockpiled soil shall be no closer than 20 feet from the edge of the burial pit.

An alternative to prevent bloating of catastrophic mortality die off could include opening animal thoracic, abdominal cavities, and viscera prior to placing required cover.

Information such as burial site location, type and quantity of mortality, burial date, and other pertinent details shall be recorded at the time of burial.

earthen wall shall be sloped back at 1 1/2 horizontal and 1 vertical.

Burial Pit, Size and Capacity

Pits shall be sized to accommodate catastrophic mortality using appropriate weight to volume conversions. Capacity shall be in accordance with criteria acceptable to state and local regulatory agencies. The burial pit shall be a minimum of 4 feet wide, 3 feet deep, and with length necessary to accommodate mortality. Depth shall accommodate a minimum of 2 feet of cover over the mortality. Pit bottoms shall be relatively level. Lengths may be limited by soil suitability and slope. If more than one pit is required, they shall be separated by a minimum of three feet of undisturbed or compacted soil. The burial site shall be of sufficient volume to contain the mortality with a minimum of two feet of soil cover. The burial site shall be finish graded to slightly above natural ground elevation to accommodate settling.

Burial Pit Structural Loading and Design

Vehicular traffic shall not be allowed within four feet of the pit edge. For pits that are four to five feet deep, a strip 18 inches wide and one-foot deep will be dug around the perimeter of the main pit so the remaining vertical wall will not exceed four feet. For pits greater than five feet deep, the

CONSIDERATIONS

Major considerations in planning animal mortality management are:

- Available equipment at the operation
- The management capabilities of the operator
- The degree of pollution control required by state and local agencies
- The economics of the available alternatives
- Effect on neighbors.

Consideration should be given to prevailing wind direction and neighbors when siting animal mortality disposal facilities. A minimum 900 feet (270m) should separate the facility from the nearest neighboring residence.

Runoff from the livestock or poultry facility, or from outside areas should be diverted away from the animal mortality disposal facility.

Facility sizes for composting large animal carcasses should reflect the longer compost periods required.

The following table lists factors that could be used in determining minimum daily weight of animal mortality when sizing incinerators:

<u>TYPE OF ANIMAL</u>	<u>DAILY LOSS FACTOR</u> (pounds/day/animal)
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Chicken:

Broilers	0.0125
Laying hens	0.0035
Breeding hens	0.0048
Breeder, male	0.0238

Turkeys:

Hen	0.0196
Tom, light	0.0468
Tom, feather production	0.0741

Swine:

Suckling pigs (per sow)	0.0720
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Poultry operations often experience higher rates of mortality as the birds reach maturity. The capacity of incinerators should be sized to ensure the mortality of the large birds can be handled within the time frame allowed for incineration.

Incineration produces varying quantities of ash that will need to be properly handled.

Vegetative screens and topography can be used to shield the animal disposal facility from public view, and to minimize visual impact.

Bio-security concerns should be addressed in all aspects of planning, installation, and operation and maintenance of an Animal Mortality Facility.

Ground disturbing activities such as excavation and site preparation for disposal facilities have the potential to affect significant cultural resources.

Operators should maintain a list of current phone numbers for state and local officials to aid in notification if disease-related catastrophic mortality occurs.

Safety devices such as fencing, warning signs, and freezer locks may be necessary at certain sites.

PLANS AND SPECIFICATIONS

Plans and specifications for animal mortality management shall be in keeping with this standard and shall describe the requirements for applying this practice to achieve its intended purpose.

DESIGN DATA

1. Detailed soils, foundation, and site investigation report with supporting data.
2. Field survey.
3. Plan view of system layout.
4. Anticipated mortality and material storage needs for the period determined in the Nutrient Management Plan.
5. Complete design computations and drawings to describe the horizontal and vertical position of structures and their relation to adjacent physical features. The distance to the nearest area or public use or residence of anyone other than the owner or his tenant shall be recorded.

Include required sealing treatments or liners.

6. Material quantities.
7. Structural details of all components.
8. References and certifications of components supplied by others (pumps, commercial liner specifications, truss manufacturer certification, etc.).
9. Drainage/grading plan if needed.
10. Special safety requirements.
11. Temporary erosion control measures during construction.
12. Completed operation and maintenance requirements.
13. Environmental Evaluation Form VA-EE-1.

CHECK DATA

1. As-built drawings showing changes from the design.
2. As-built volume.
3. Component certifications; i.e., truss rafters, holding pond liner, existing components of new waste system, etc.
4. NRCS or PE storage facility certification.
5. Statement that disturbed areas have been stabilized and fencing is adequate.
6. A copy of any required permits.

OPERATION AND MAINTENANCE

Operation and maintenance requirements applicable to this practice include, but are not limited to the items listed below. Operation and maintenance responsibilities will be discussed with the operator. The requirements in the individual operation and maintenance plan shall be consistent with the practice purposes, intended life, and design criteria. Safety considerations shall be prominently displayed in the plan.

NORMAL MORTALITY

Animal mortality facilities will normally be operated or used on a daily basis. At each operation or use, the facility shall be inspected to note any maintenance needs or indicators of operation problems.

CATASTROPHIC MORTALITY

Possible locations for catastrophic mortality facilities shall be located during the planning process to be operated as needed.

Where composting is used for catastrophic mortality disposal, the operation and maintenance plan shall identify the most likely compost medium, possible compost recipes, operational information, and equipment that will need to be readily available.

REFERENCES

1. ACI 318, 360, 530.
2. ASTM D653, D698, D2488, D1760.
3. ASAE Specifications: EP378.3, EP393.2, EP288.5, S288.
4. Agricultural Waste Management Field Handbook, Chapters 7 and 10, NEH Part 651.
5. Basic Building Code, 12th Edition, 1993, Building Officials and Code Administrators, Inc. (BOCA).
6. "Manual of Steel Construction", American Institute of Steel Construction.
7. National Design Specifications for Wood Construction", American Forest and Paper Association.
8. National Engineering Manual, Part 520.
9. Virginia NRCS Field Office Technical Guide, Section IV.
10. NRCS, Technical Release, TR-74.

11. NRCS, Field Book for Describing and Sampling Soils.
12. NRCS GM 420, Part 401 – Cultural Resources.
13. National Engineering Handbook, Part 637, Chapter 2, Composting.

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Approved Practice Narratives

(No.)

CODE 316

316 D1 Animal Mortality Facility: A composting facility designed to contain normal mortality will be installed at the approximate location shown on the Conservation Plan map. The design, construction specifications, and operation and maintenance requirements will be provided.

316 D2 Animal Mortality Facility: A freezer will be used for normal mortality storage until removal from the farm. The

design, construction specifications, and operation and maintenance requirements will be provided.

316 D3 Animal Mortality Facility: An incinerator designed to handle the normal mortality will be installed at the approximate location shown on the Conservation Plan map. The design, construction specifications, and operation and maintenance requirements will be provided.

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